Computing News

News from the Computing Division
Fermi National Accelerator Laboratory
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This issue of the Computing Division Newsletter contains a series of articles about the Physics Research Equipment Pool (PREP) and the Equipment Support Department (ESD). The PREP equipment pool provides electronic instrumentation for High Energy Physics (HEP) research experiments according to agreements (MOUs--memoranda of understandings) between approved experiment collaborations and Fermilab. A primary responsibility of the Equipment Support department is to provide and support the electronic equipment in the PREP equipment pool used by the running experimental program. The Electronics Support Services group (ESS) provides technical support and maintenance for electronic instrumentation and systems used by experiments and other Fermilab groups. The Equipment Logistics Services group (ELS) provides inventory tracking, equipment distribution and reallocation, receiving services for PREP and also acts as a vender liaison for many departments in the Computing Division.

There are several new directions that "PREP" is pursuing on behalf of the Laboratory. These include preparing to maintain some of the instrumentation for RUN II and other smaller projects based on formal support MOUs. These agreements document the specific modules and support responsibilities that are mutually agreed upon by the experiments and Fermilab through the Computing Division. Secondly, Laboratory Management has recently agreed to make selected equipment in the equipment pool that is no longer essential to the Fermilab experimental program available to universities, experiments and other organizations in the scientific community. A third initiative provides repair service for NIM, CAMAC and FASTBUS modules for other DOE Laboratories under the umbrella of a newly negotiated proposal.

PREP -- Past, Present and Future

When people refer to "PREP" they may be referring to the equipment pool, the logistics services group or the electronics support group or all of the above. The PREP Equipment Pool and the Electronics Support Services Group (previously Instrument Repair) were created nearly three decades ago. The group was first located in the village, later in Wilson Hall and currently resides on the third floor of the Feynman Computing Center. Names often associated with the PREP outfit are Art Neubauer, Chuck Andrle and the long time LeCroy Sales Representative Ed Corlett who during the 1970s and 1980s saw the volume of equipment in the PREP pool grow at a rapid rate.

The PREP equipment pool now has over 40,000 electronic instruments that are made up of things like NIM modules, CAMAC modules, FASTBUS modules, VME modules, power supplies and general test equipment. The equipment ranges from very old and somewhat dusty LeCroy NIM modules to "state of the art" VME modules that will be used in RUN II. The activity of transactions at the pool and therefore the support follows the cycles of major experimental programs. It may take many years to build the instrumentation base that is used during the experiment run and then a year or two to fully decommission the experiment once it is finished.

For many years, the primary focus of the Equipment Support Department was providing repair and diagnostic and advisory services on a wide range of HEP electronic modules. This included equipment installed in and used by the Lab's entire experimental program - Fixed Target, CDF, D0, Test Beams; equipment used in the control systems for the Main Ring, Booster and Switchyard; equipment used in the beam line control systems; and equipment utilized in support of other Laboratory engineering and scientific tasks.

In the last decade, ESD added the support of computing equipment and computing peripherals. Maintenance of Exabyte type tape drives used in many Fermilab and Experimental computing systems is a major responsibility of the Computing Division. Much

of the repair of computing equipment is not actually performed by Computing Division personnel, but instead is either performed by one of several outside contractors who operate on the Fermilab site, or by vendors to whom the equipment is shipped for repair. In these cases Equipment Support administers the vendor contracts and performs the quality assurance functions.

Most of the support of computing equipment that ESD was providing was included in a consolidated maintenance contract that went in to effect at the Laboratory in January 1997. Although ESD still has a continuing role in quality assurance of tape drives, we were able to return to what we have always done best, the support of HEP electronics. Since the early 1980s the technical staff has been very stable and averages 19 years experience each in the electronics support field, with many of those years at Fermilab.

The Equipment Logistics Group responsibilities have expanded significantly since the days when they primarily provided assistance in the PREP equipment allocation and tracking. They still are the people who are likely to greet you and speak with you when you come to get modules or information at the PREP customer service counter. However, ELS also provides logistical services, manages the stockroom areas and maintains the equipment tracking database. In addition, ELS administers service contracts laboratory wide for both computing equipment hardware and software. The staff has been successful in collaborating with other groups at Fermilab to reduce the cost of maintenance contracts each of the last three years.

Equipment Support will continue to put the PREP equipment pool in good order in the aftermath of the 1996 Fixed Target run. As the Laboratory management determines which part of the program is concluded, equipment will be reclaimed, inspected, repaired (if cost effective), and stored or excessed. ESD will continue to support and ensure adequate sparing for the FT99 experimental program as the experiments begin to ramp up activity later this year. The current equipment inventory can continue to serve the HEP community well by providing equipment to test beam efforts, test stands, and small experiments.

Support of RUN II electronics is a high priority for Equipment Support, and the Computing Division is in the process of negotiating support for some of the electronics that will be used in the RUN II experiments. The technical people in ESD are always excited by the challenge of supporting new technology and are making plans and preparations to use their expertise to provide this support. The support ESD will provide for RUN II and into the future goes beyond just repair to include working closely with experimenters to solve system problems in the field. This requires understanding difficult details of individual modules as they are commissioned and used in the experiment.

Equipment Support continues to put useful information out on the web including the specifications of most of the common HEP modules that are in the pool. Be sure to visit our web site at
`http://www-esd.fnal.gov/prep/prep.htm`
to find procedures and information. Requests for PREP equipment or information may be sent to **`prep@fnal.gov`**.

Adam Walters, awalters@fnal.gov

Management of the PREP Electronics Pool

Over the past 25 years, Fermilab has accumulated a large inventory of HEP modular type electronics (NIM, CAMAC, FASTBUS) and high voltage systems. An increasing fraction of this equipment is not as highly utilized (especially after FixedTarget99) due both to the cost effectiveness of new technology and that the older modules are not meeting the demands of today's higher data rates. With the reduction in the number of experiments at Fermilab, fewer vendors supplying the NIM, CAMAC and FASTBUS modules used for data readout and triggering, and the reduction in available funds to the field, the role of the Fermilab/Computing Division's Physics Research Equipment Pool (PREP) as a center for HEP module distribution and support is being explored.

PREP receives numerous inquires for equipment from universities, experiments and other organizations involved in High Energy Physics research. This plan allows those institutions the opportunity, on a limited basis, to borrow HEP equipment from Fermilab for teaching and research endeavors. Most of the available equipment to be loaned is older commercial NIM, CAMAC and high voltage systems. Since very little FASTBUS will be used by Fermilab in the future, much of the current inventory can be made available for loan. This equipment is viable, still used, and in demand outside of Fermilab.

This plan is a limited enterprise which will not be allowed to impact the current Fermilab programs or budget. Scheduling and duration of loans are important for planning purposes. Experiments at Fermilab will need to carefully prepare requirements and agreements with the Computing Division management so proper forecasting of needs can be accomplished. Among the conditions will be a requirement that the equipment be returned at short notice should an unexpected need for it arise as part of the FNAL program. Expenses such as shipping costs will be borne by the borrowers unless a specific arrangement is made with the lab.

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Several loans have already been granted by Fermilab where the users have indicated savings of thousands of dollars by re-using modules that were available from Fermilab. Expanding and formalizing this process can result in even more savings to the HEP community which has a finite budget. By providing HEP electronic instrumentation to other universities, experiments and laboratories and for teaching or small research setups, Fermilab can be recognized for providing a service that is valued by the HEP community. If you have interest in pursuing a loan or wish to understand the details of conditions that are in place for this plan, please contact PREP at **prep@fnal.gov**. The loan request will then be first forwarded to Computing Division management for approval and then to the Program Planning Office in the Directorate for final review and approval.

Adam Walters, awalters@fnal.gov
Carl Schirtzinger, zinger@fnal.gov
Ruth Pordes, ruth@fnal.gov

Hardware Support MOUs for RUN II

The support of RUN II electronics is the concern of many groups at the Laboratory. The Computing Division is in the process of negotiating a pilot project to support some of the electronics that will be used in the RUN II experiments. The MOU, which must be approved by the directorate, documents the specific support responsibilities of the Computing Division and other involved parties.

As this support role is being defined, preparations have started to build expertise to service the new equipment, much of which is designed by universities and Fermilab. New diagnostic equipment will have to be obtained and technicians will need to be trained in its use. The Equipment Support Department is becoming more involved in assisting the Electronic Systems Engineering Department in meeting its commitments in the development and production of electronics for the SVX for Run II. ESD is contributing fabrication services for the production boards and the check-in testing of those modules. Both commercial and Fermilab designed diagnostic test software and test stands are being upgraded or developed to support these new modules.

Adam Walters, awalters@fnal.gov
Ruth Pordes, ruth@fnal.gov

External Support of HEP Equipment for other DOE Laboratories

A new direction for the Laboratory is providing HEP repair support of NIM, CAMAC and FASTBUS instrumentation to the other DOE laboratories. Several vendors are reducing their level of HEP electronics support and the Computing Division has received requests by other DOE Laboratories to provide limited support. This new direction takes advantage of the existing infrastructure and technical expertise that Fermilab has built and maintained. This plan was implemented with full recovery of all costs incurred by Fermilab. The cost of materials (parts) used in the repair as well as the labor, logistics & shipping costs and administrative costs will be passed on to the end user of the service.

With the need to supply in-house support for the Laboratory's HEP instrument base, Fermilab has built up an infrastructure of repair parts, documentation, test equipment, test stands, software diagnostics, business processes and tracking databases. Fermilab has also developed personnel infrastructure with a high level of expertise in electronic repair and maintenance, software diagnostics development and logistics. To maintain a high degree of efficiency, the list of supported modules for this program reflect only modules that ESD has a history of supporting and so takes advantage of the expertise and infrastructure.

There is already a great deal of technical information relating to HEP equipment made available on the WWW by the Computing Division. The web address is http://www-esd.fnal.gov/prep/prep.htm. Fermilab will continue to increase expertise and knowledge of HEP modules by exploring the various ways these modules are used and will become a hub of information. This information is continuing to be made available through various avenues such as the web.

The impact on resources and growth of this service is subject of Laboratory policy and is being implemented by Computing Division Management. Pre-authorization before equipment is shipped to Fermilab for maintenance is required. By proceeding in this manner, Fermilab experimental programs and projects will not be negatively impacted by the Computing Division's commitment to this program.

Adam Walters, awalters@fnal.gov
Carl Schirtzinger, zinger@fnal.gov
Ruth Pordes, ruth@fnal.gov

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PREP Logistics and Customer Service Counter

The PREP Customer Service Counter is maintained by the Equipment Logistics Services (ELS) Group. Located on the third floor of the Feynman center, the Customer Service Counter offers a number of different services to users both within the Laboratory, as well as to visiting scientists.

First and foremost, the Customer Service Counter is a place where users can get information. If an individual is unsure about how to handle their equipment repairs, or is unfamiliar with the processes of the Equipment Support Department, the Service Counter staff is there to answer questions. The staff will guide individuals through paperwork and the approval processes and provide general assistance to see that the needs of the users are met. The user can exchange defective equipment according to negotiated MOU agreements or drop off any CD supported equipment for repair on a "Return to User" basis instead of exchange. The Service Counter personnel will arrange for the pickup or delivery of PREP Pool equipment as authorized by Equipment Manager.

The ELS Expediting staff will send equipment to off-site vendors when in-house support is not available. The Expediting staff interfaces with vendors, users and technicians to relay pricing and shipping information and the job status. The Expediter acts for the Computing Division when dealing with vendors to return items for credit, determining warranty information and receiving “new item” exchanges.

In addition, the Service Counter is the place where individuals may pick up their newly purchased CD equipment or withdraw stock previously reserved for specific projects. The Service Counter is also a place for individuals to turn-in CD owned equipment which is no longer needed. This equipment may go back into the Pool or it may be considered for Excess or Scrap. The logistics personnel can also arrange for the equipment to be picked up and delivered.

Service Counter personnel provide assistance regarding off-site loans. This includes providing information regarding authorization requirements, as well as assisting with required paperwork. Staff also help coordinate logistics arrangements for having the equipment shipped off site.

In case of an emergency, certain Pool equipment may be obtained off hours through Fermilab Security access to the counter. Detailed procedures and guidelines for off hours access may be found at the counter or on the web at **`http://www-esd.fnal.gov/prep/off_hrs.htm`**.

There is an X-terminal located at the counter which provides individuals with immediate access to web sites that provide information about the Equipment Support Department, and PREP policies and procedures. If you would like to learn more about the ELS Service Counter operation you can call 630-840-3447, send email to **`prep@fnal.gov`**, or visit us at our web site at **`http://www-esd.fnal.gov/ELS/els_counter.htm`**.

Laurie Myers, lmyers@fnal.gov

Software and Hardware Maintenance Contracts

In addition to its many support and logistic services, the Equipment Support Department also administers several large software and hardware maintenance contracts. These maintenance contracts deal with major vendors such as Silicon Graphics, Inc., Sun Microsystems, Digital Equipment Corporation, International Business Machines and others that provide software and hardware support. Part of the Equipment Logistic Services group, the contracts maintenance staff is located on the third floor of the Feynman Center.

Working in conjunction with Computing Division technical liaisons, the ELS staff is responsible for ensuring that maintenance contracts are managed accurately, efficiently and provide cost effective solutions for the Laboratory. This is done through direct contact with customers regarding newly procured equipment and software through the life cycle to the point where it needs to be taken off contract due to obsolescence. The ELS staff tracks its maintenance contracts through the use of the Miscomp Equipment Database (**`http://miscomp.fnal.gov/`**). In order to maintain the accuracy of this database, communication with customers, CD technical liaisons, and vendors is essential.

The ELS contracts staff are heavily involved with the vendors and assist in the negotiations of vendor agreements. The staff also acts as a liaison between Laboratory customers and the vendors, helping to get pricing and service information; the staff then communicates back to the users regarding their options. Once a decision is made, ELS staff will then follow through to ensure that the needs of the users are met. The ELS staff also work diligently on resolving vendor issues such as service delivery problems which require feedback and communication from the end customer.

Outside vendor services are a significant cost to Fermilab and are continually being monitored and evaluated in an effort to improve these services and reduce costs. The ELS staff work with the Fermilab Accounting Department on the yearly chargeout process and provides each Division with detailed reports of their current maintenance agreements. This gives the end customers the opportunity to review the coverage and prices included on their current contracts. As a result Divisions may make the decision to add or subtract equipment or software from contracts. Because each Divi-

sion is best able to make informed decisions regarding the status of their own maintenance needs, this chargeout process has resulted in significant savings to the Laboratory in each of the past three years.

In addition to maintaining the contracts, ELS also provides software media and documentation distribution services. Many software licenses are now also being tracked through the miscomp equipment database.

ELS maintains a "High Availability Systems – 7x24 Hardware Support" list. These systems have hardware support coverage 24 hours a day, 7 days a week with typically a 4 hour response time by the vendor. The list may be viewed at **`http://www-esd.fnal.gov/ELS/els_cdmaint.htm`**

The ELS staff provides the Computing Division with a centralized service center to assist customers with all their software and hardware maintenance needs. For more information about the ELS Contracts staff send email to **`cdmaint@fnal.gov`** or visit our web site at **`http://www-esd.fnal.gov/ELS/els_cdmaint.htm`**.

Laurie Myers, lmyers@fnal.gov

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